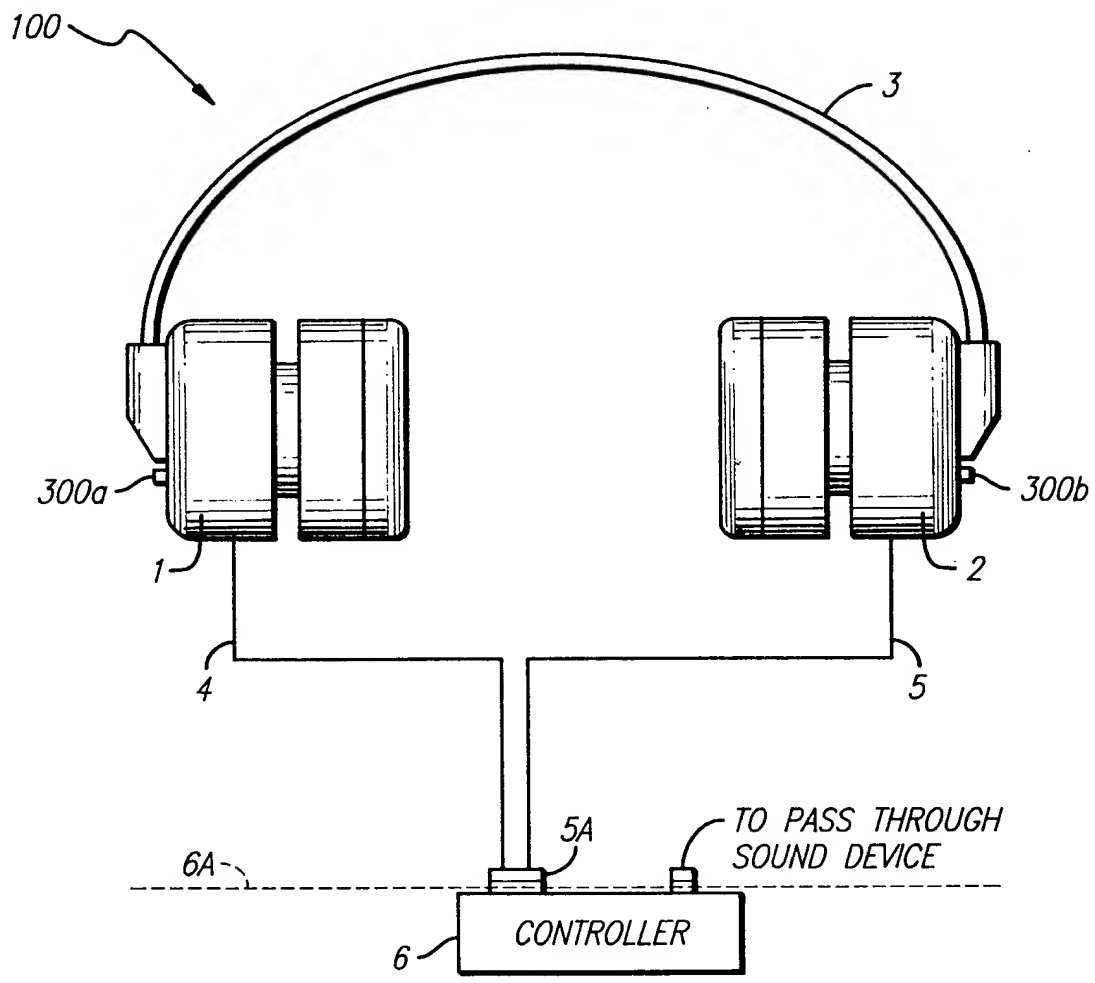

100
3
300a
300b
1
2
4
5
5A
TO PASS THROUGH SOUND DEVICE
6A
CONTROLLER
6

FIG. 1

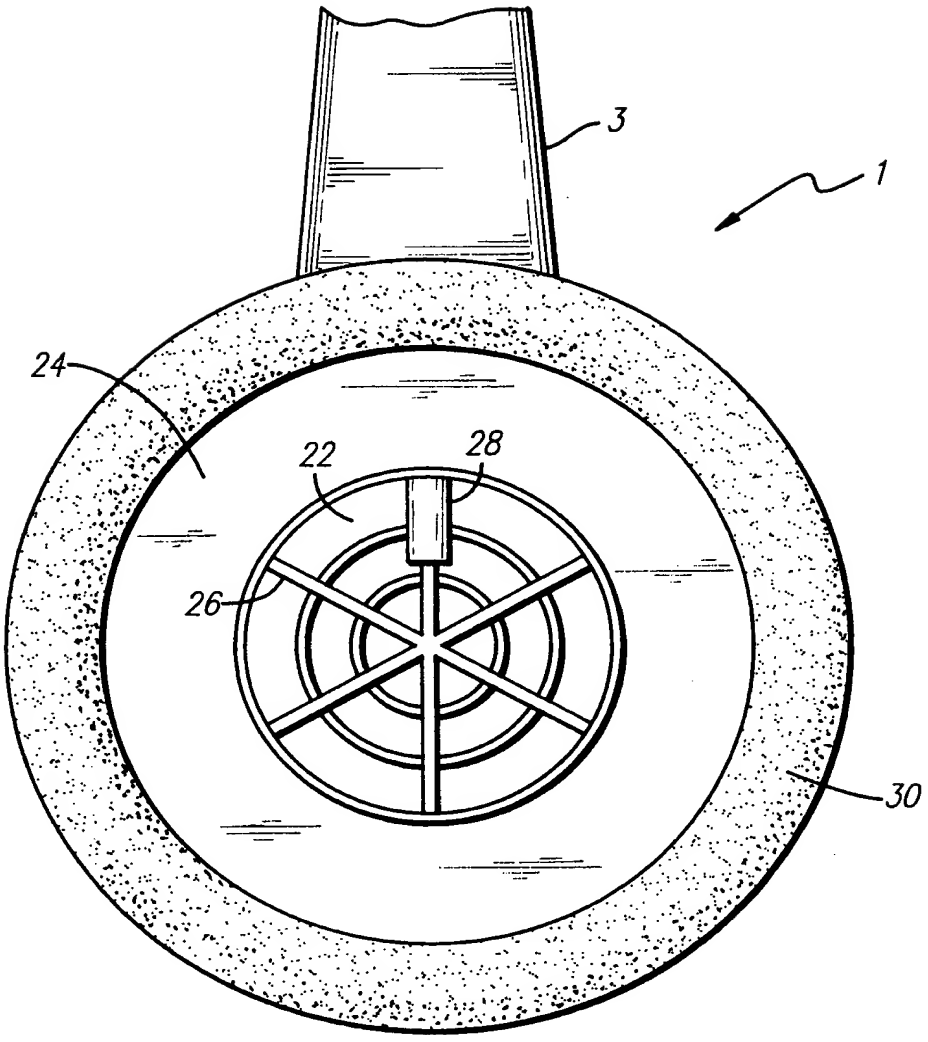


FIG. 2A

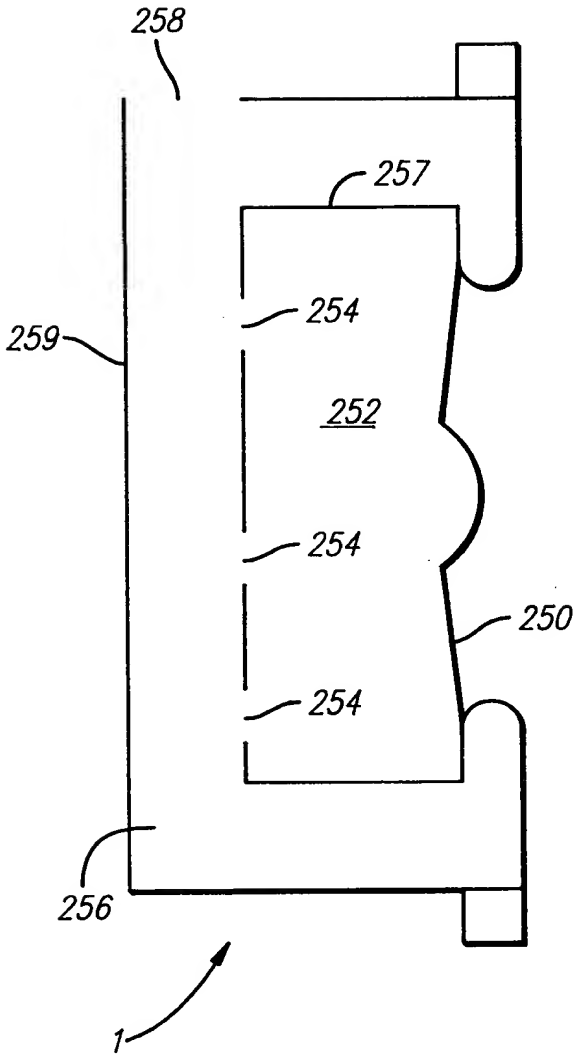


FIG. 2B

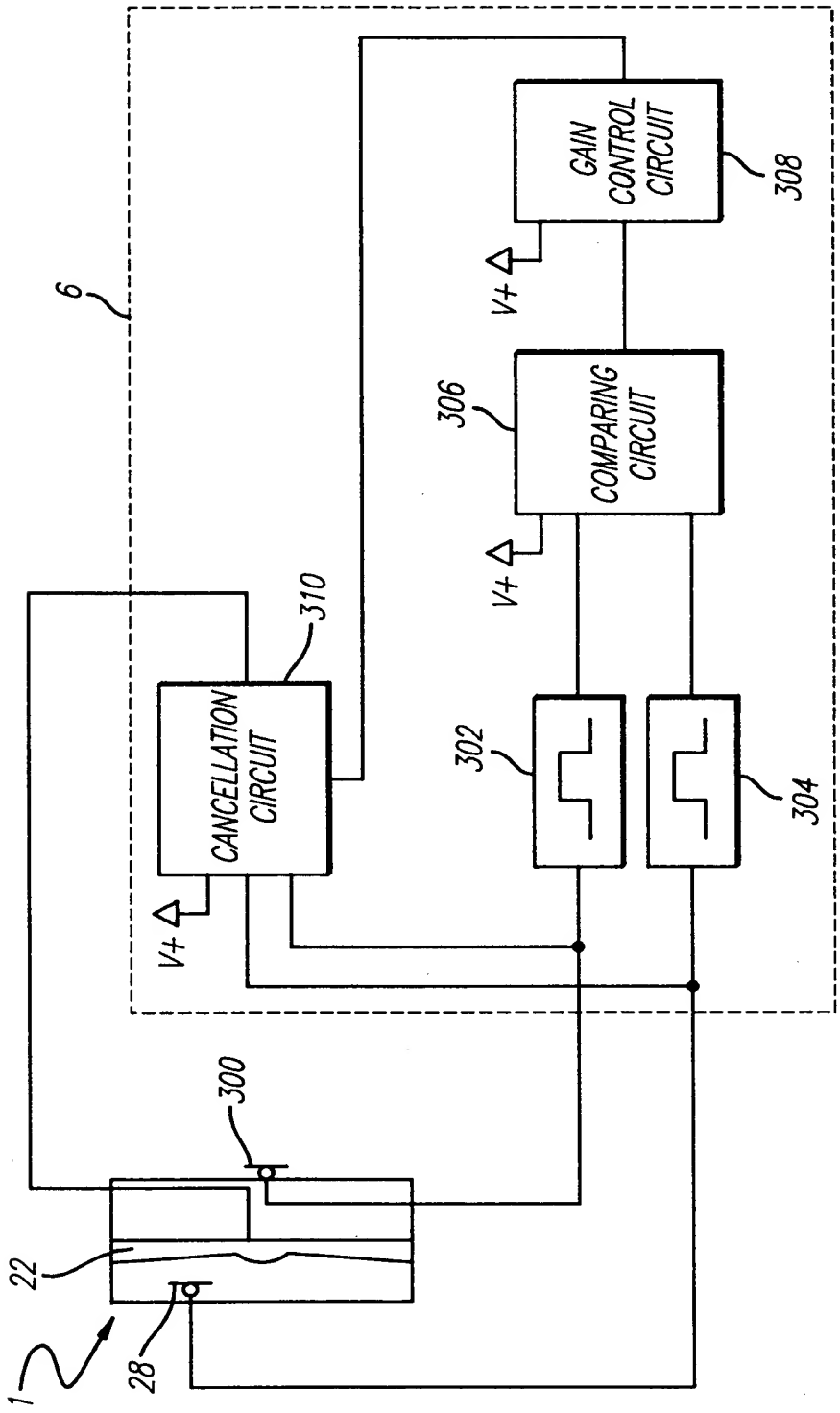

6
GAIN CONTROL CIRCUIT
308
V+
306
COMPARING CIRCUIT
V+
310
CANCELLATION CIRCUIT
V+
302
304
300
22
28
1

FIG. 3

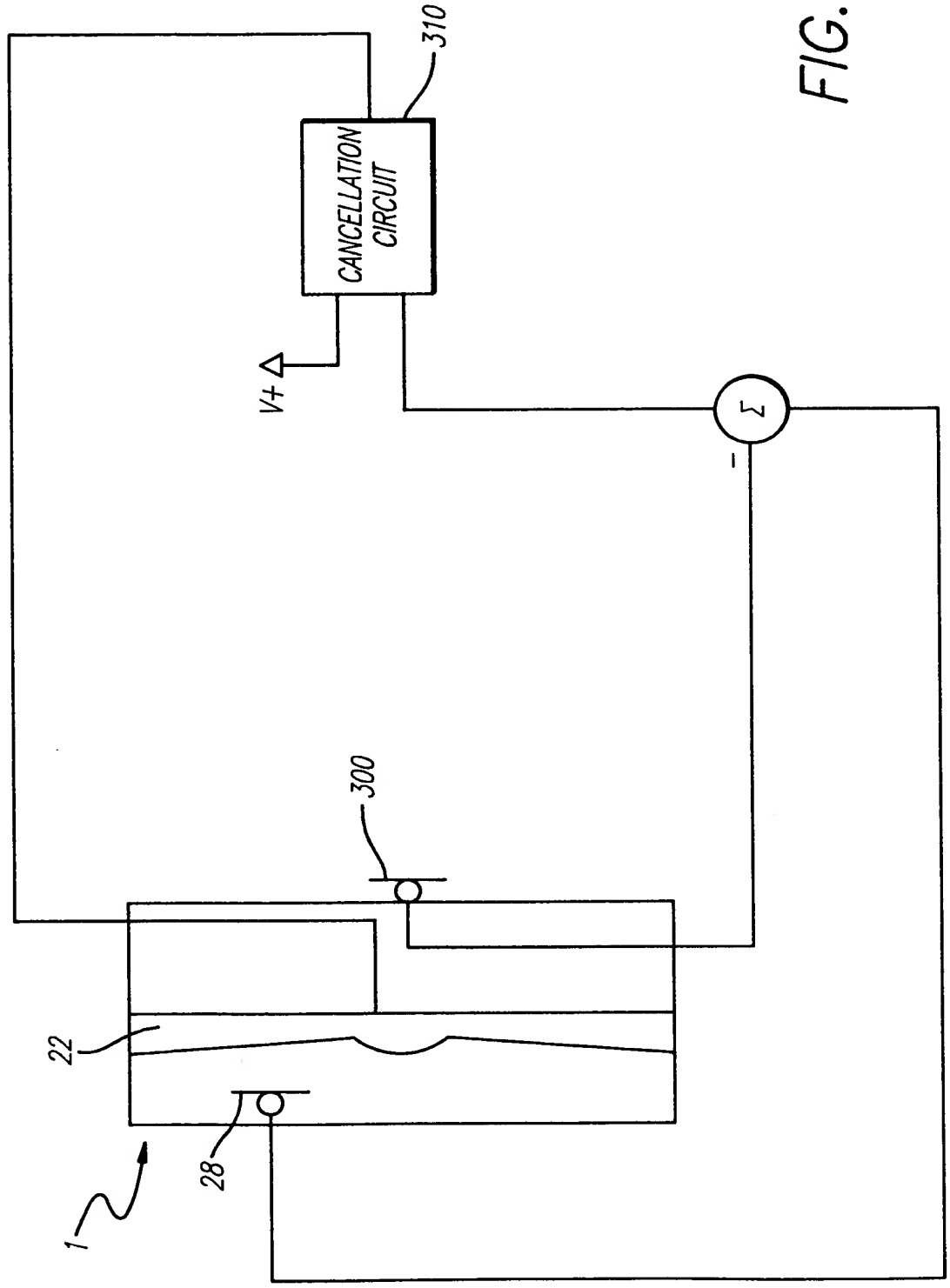


FIG. 3A

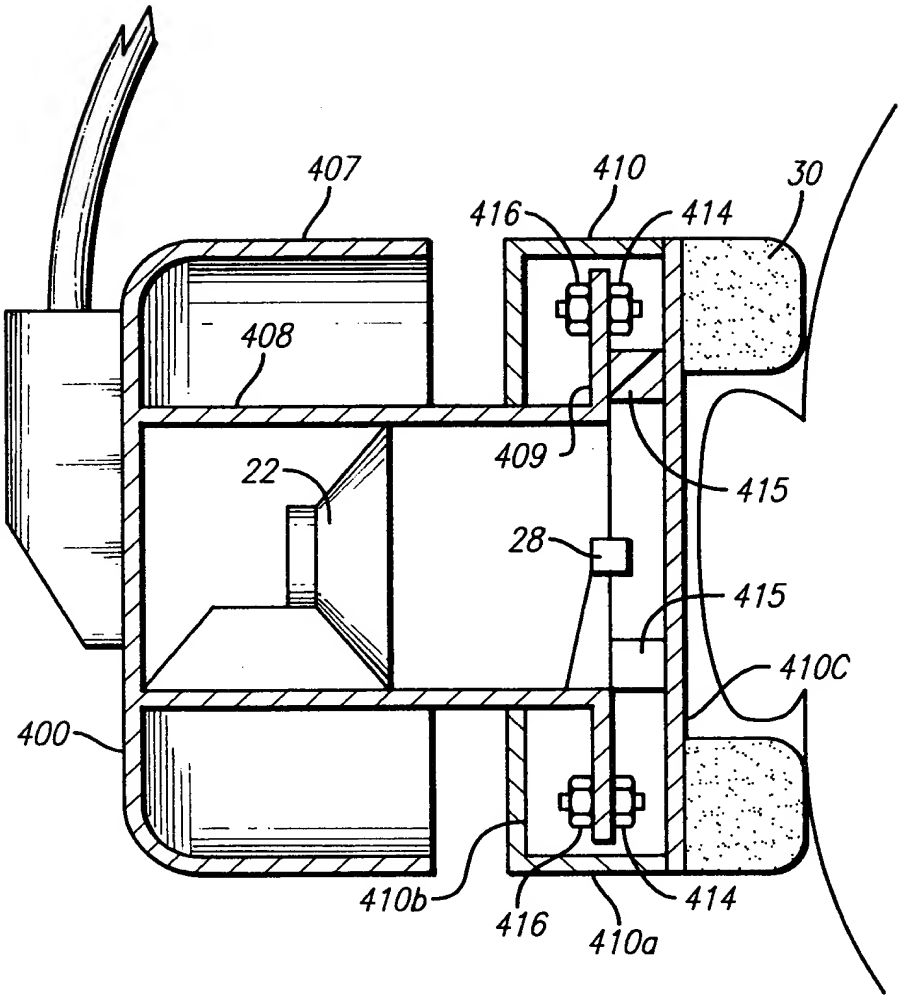

407
410
30
416
414
408
409
22
415
28
415
410C
400
410b
416
414
410a

FIG. 4

FIG. 5

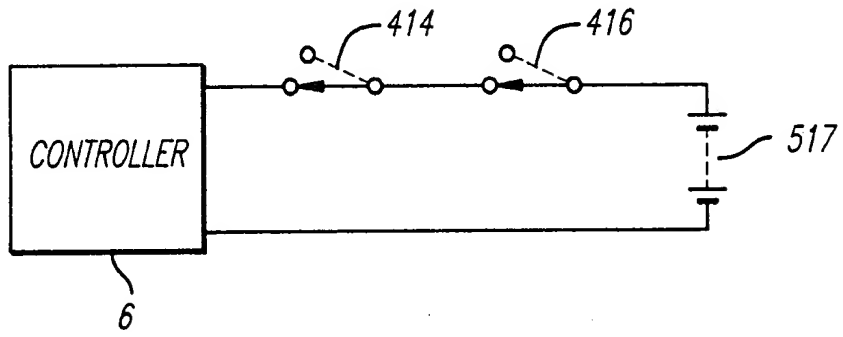
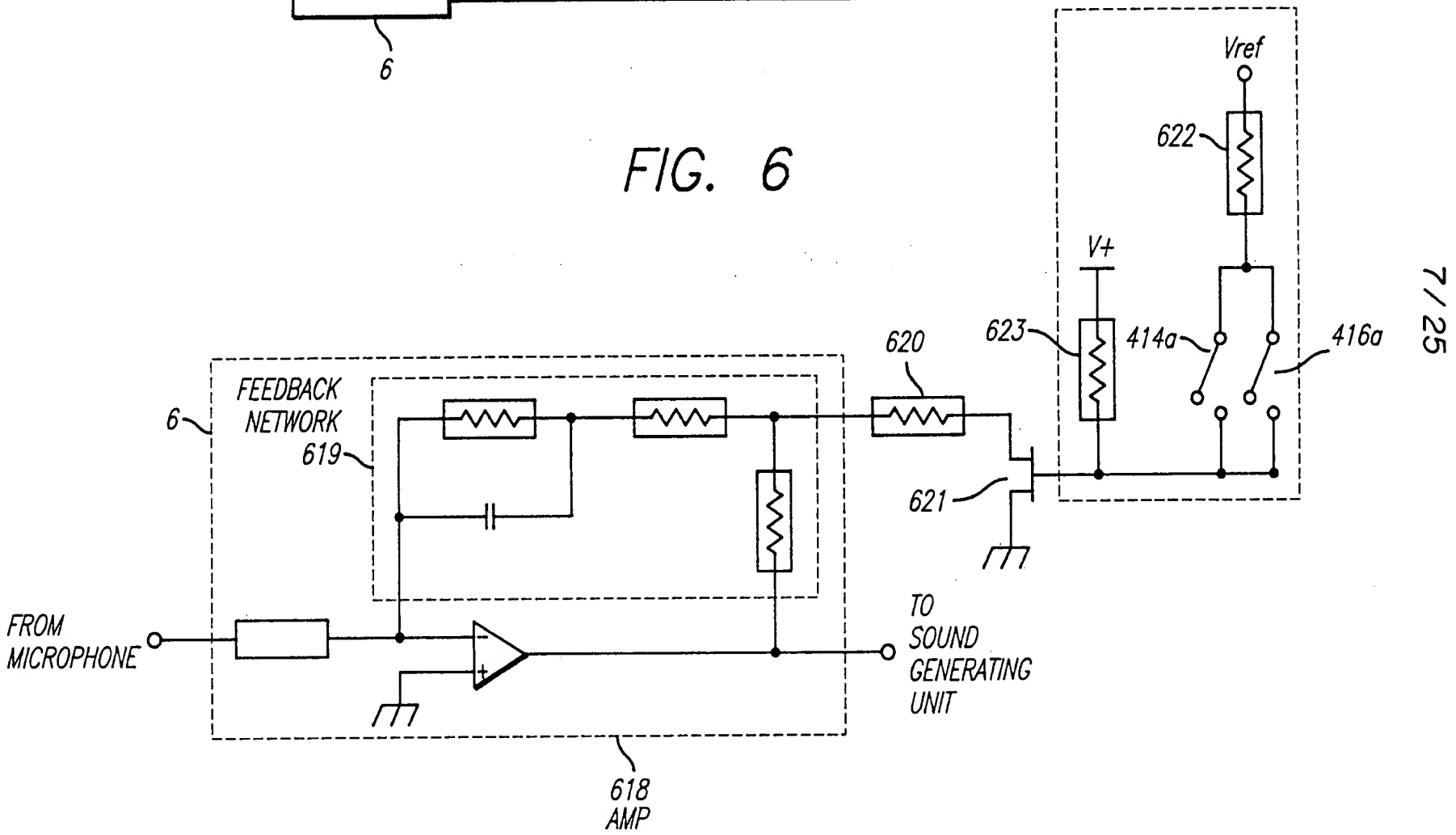

414
416
CONTROLLER
517
6

FIG. 6


Vref
622
V+
623
414a
416a
620
FEEDBACK
NETWORK
6
619
621
FROM
MICROPHONE
TO
SOUND
GENERATING
UNIT
618
AMP

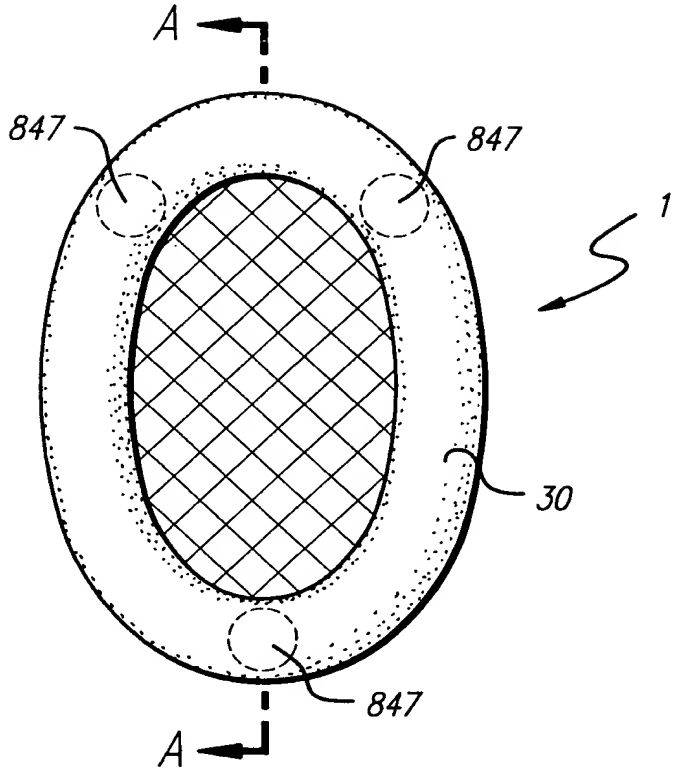


FIG. 7

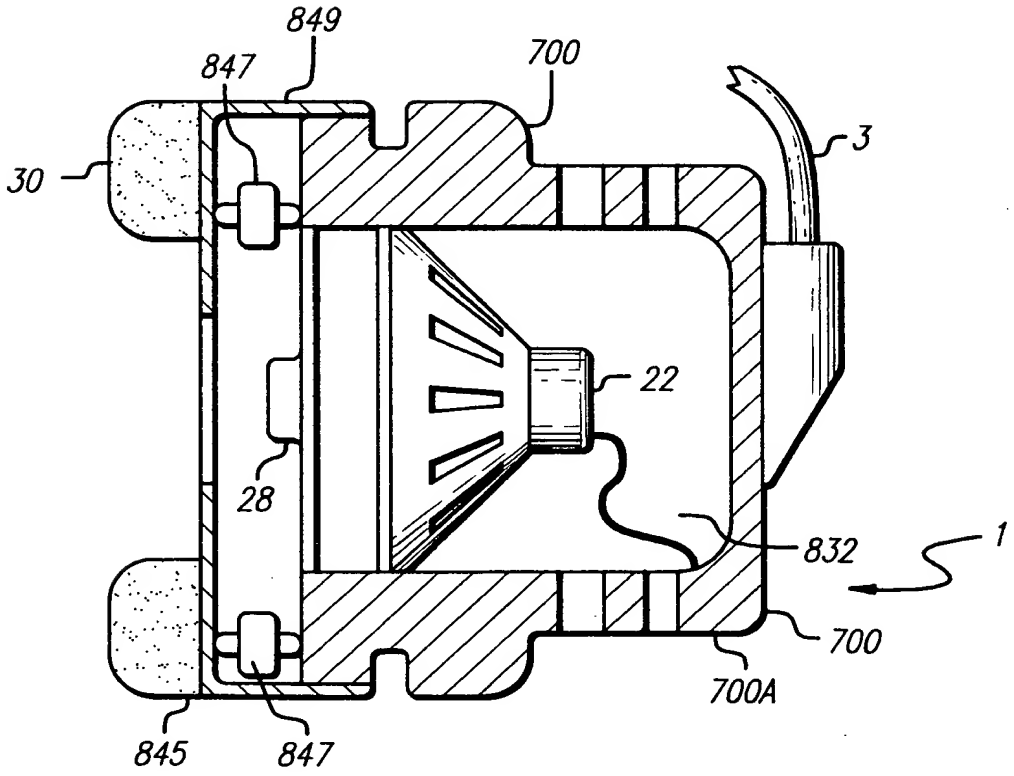
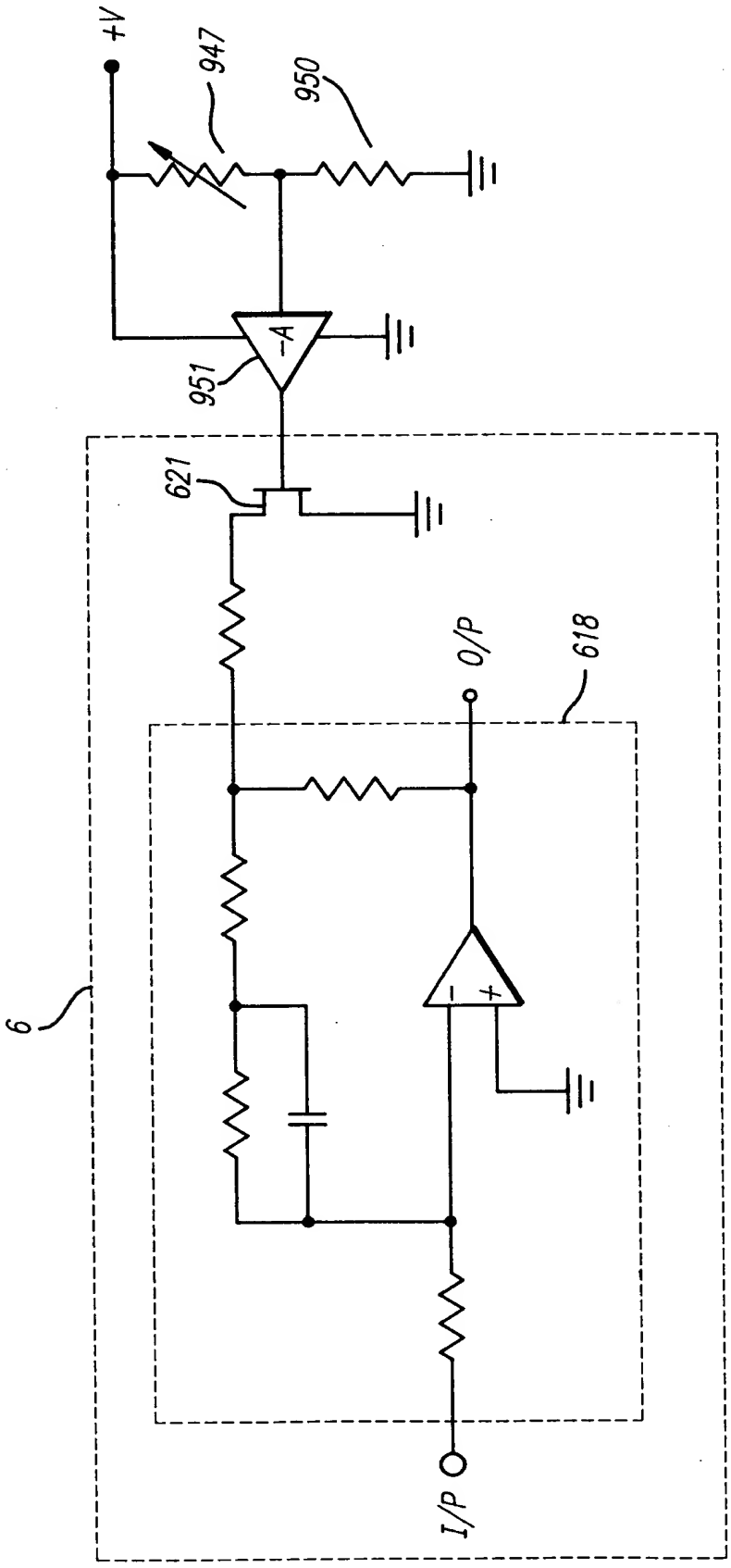


FIG. 8

FIG. 9A



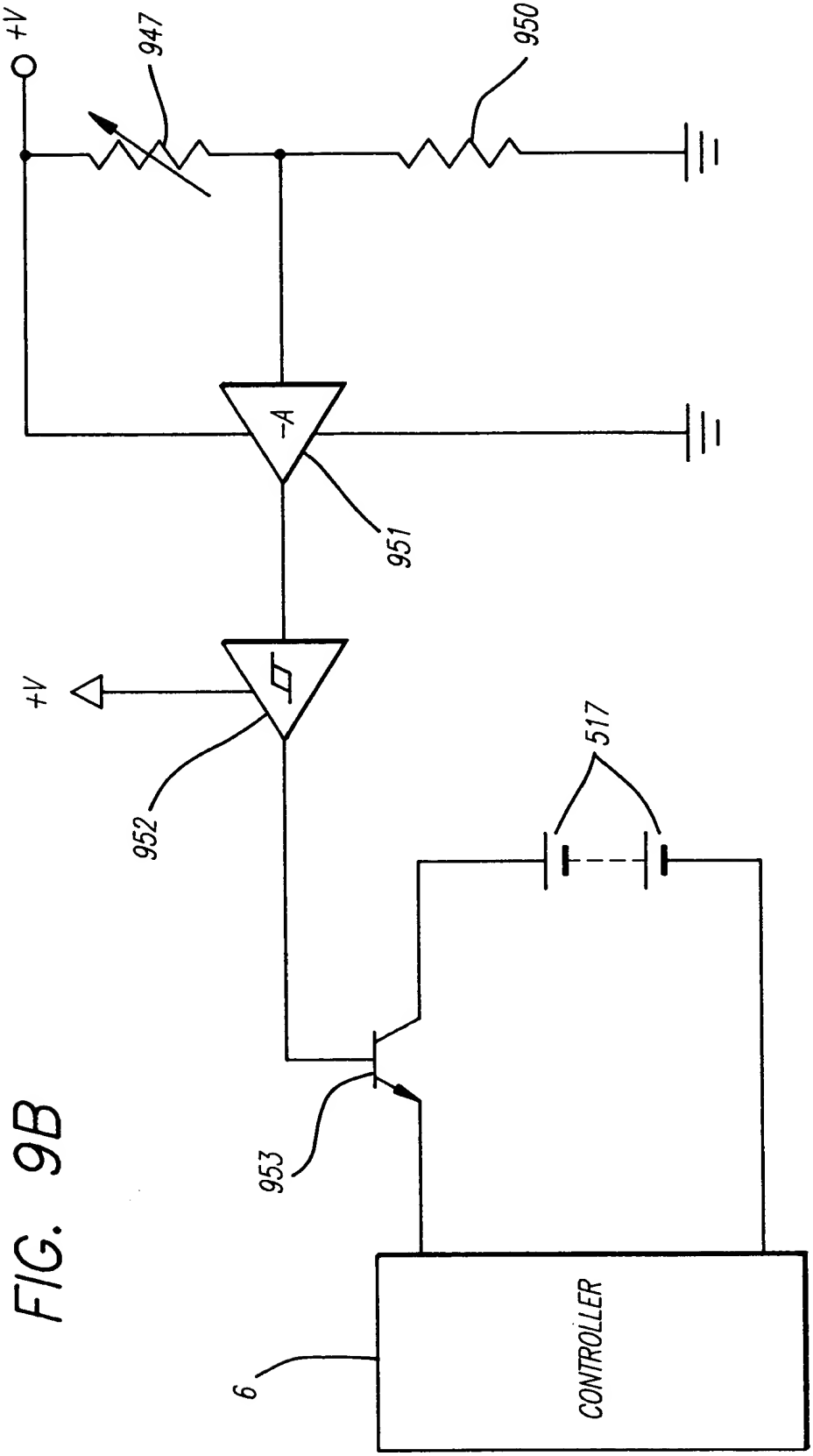
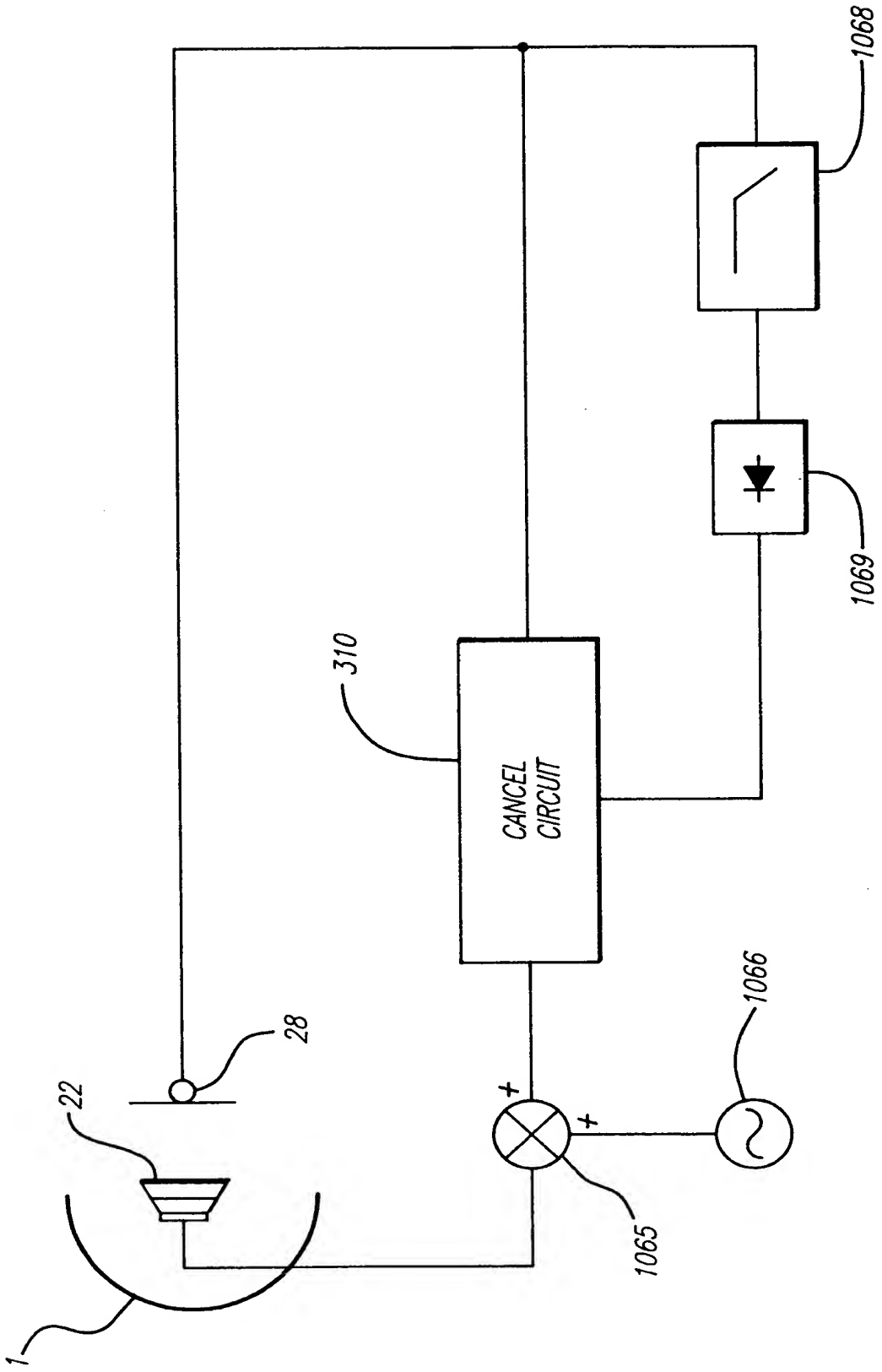


FIG. 9B

FIG. 10



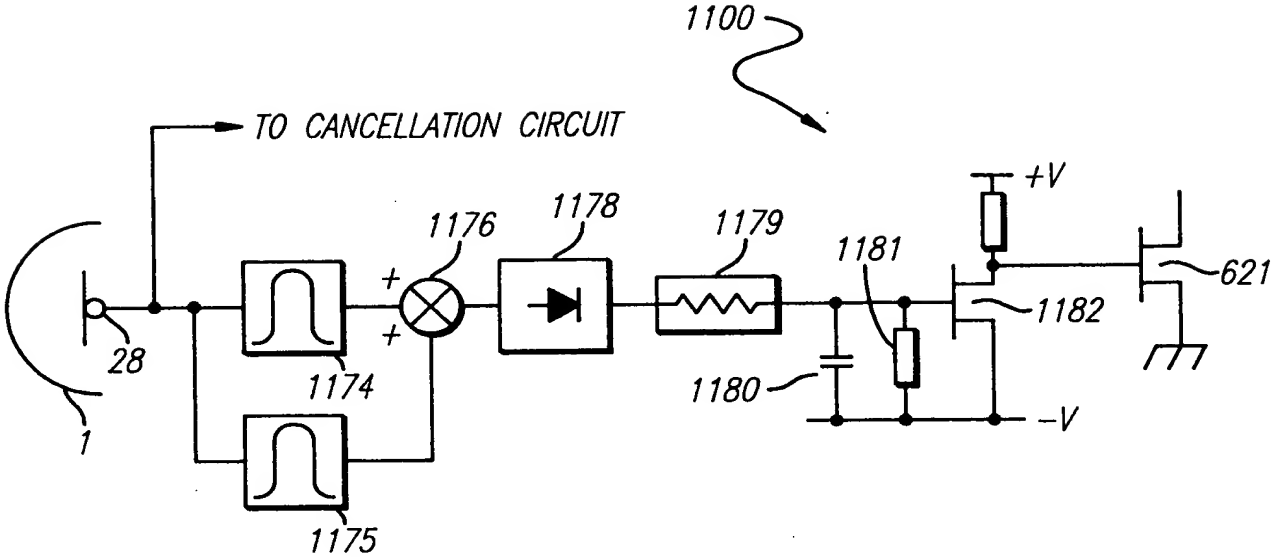

1100
TO CANCELLATION CIRCUIT
+V
1176
1178
1179
1181
621
1182
28
1174
1180
1
-V
1175

FIG. 11

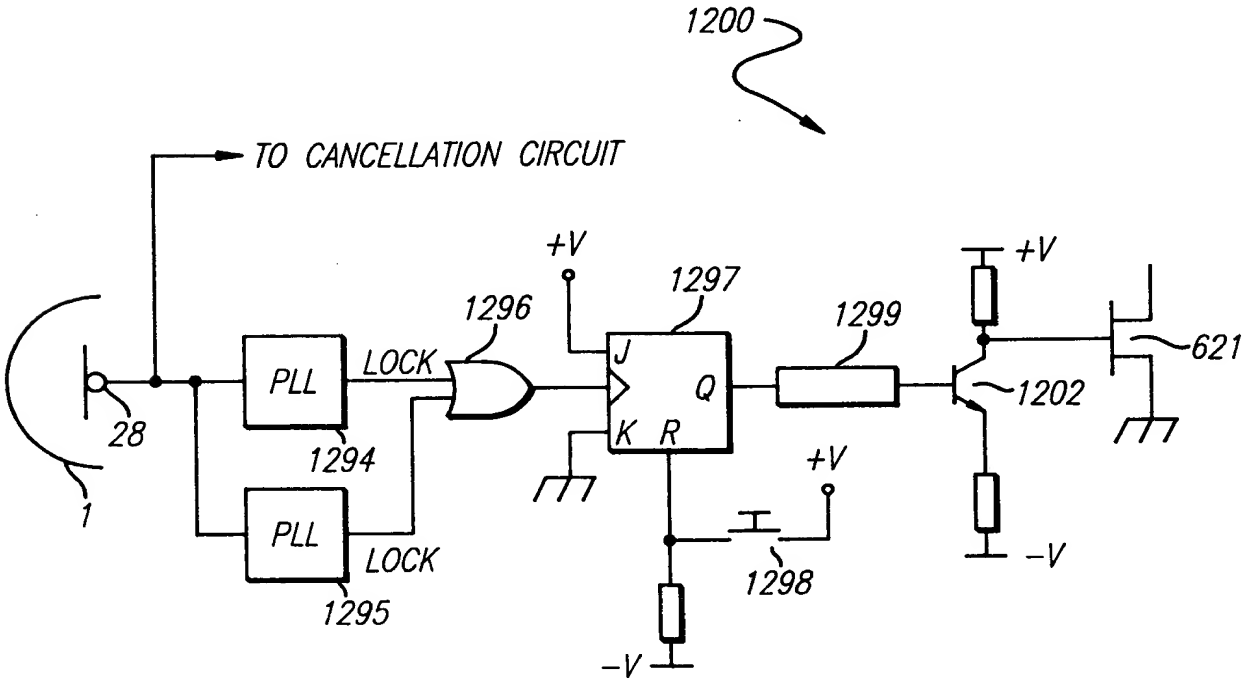

1200
TO CANCELLATION CIRCUIT
+V
1297
+V
1296
1299
621
J
Q
PLL
LOCK
1202
28
K R
1294
+V
1
PLL
LOCK
1298
-V
1295
-V

FIG. 12

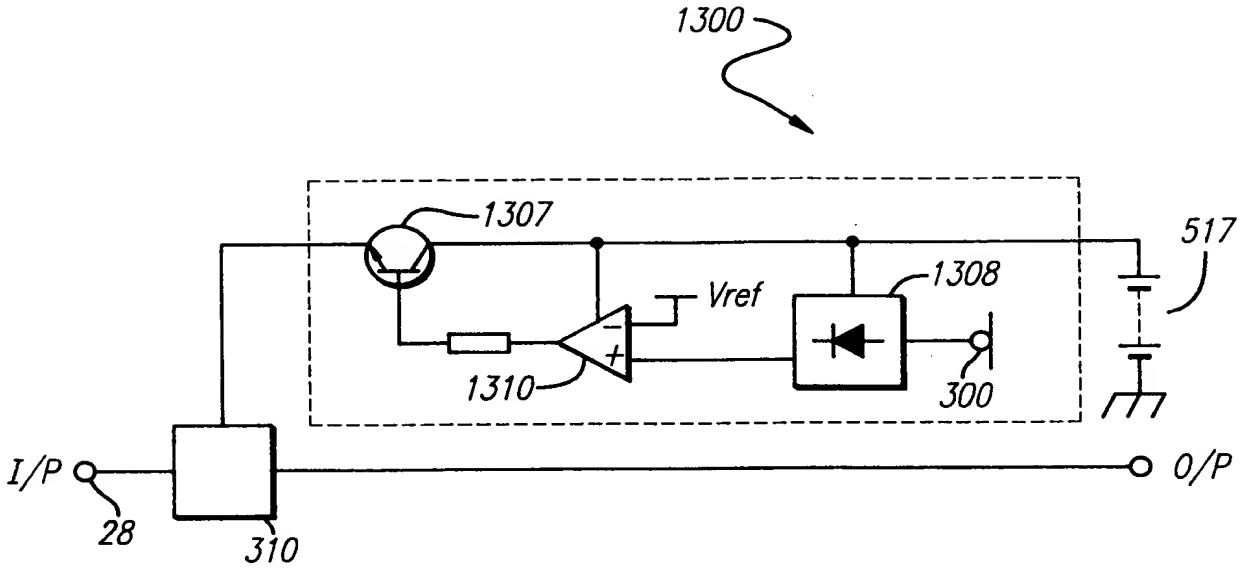

1300
1307
517
Vref
1308
1310
300
I/P
28
310
O/P

FIG. 13

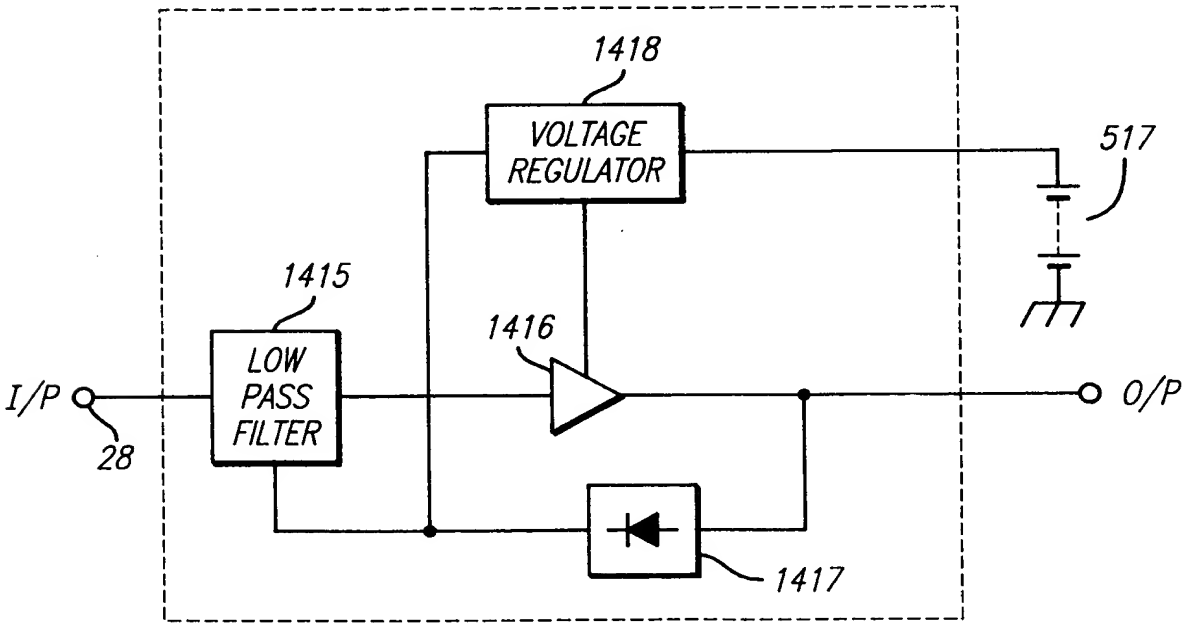

1418
VOLTAGE REGULATOR
517
1415
1416
LOW PASS FILTER
I/P
28
O/P
1417

FIG. 14

FIG. 15

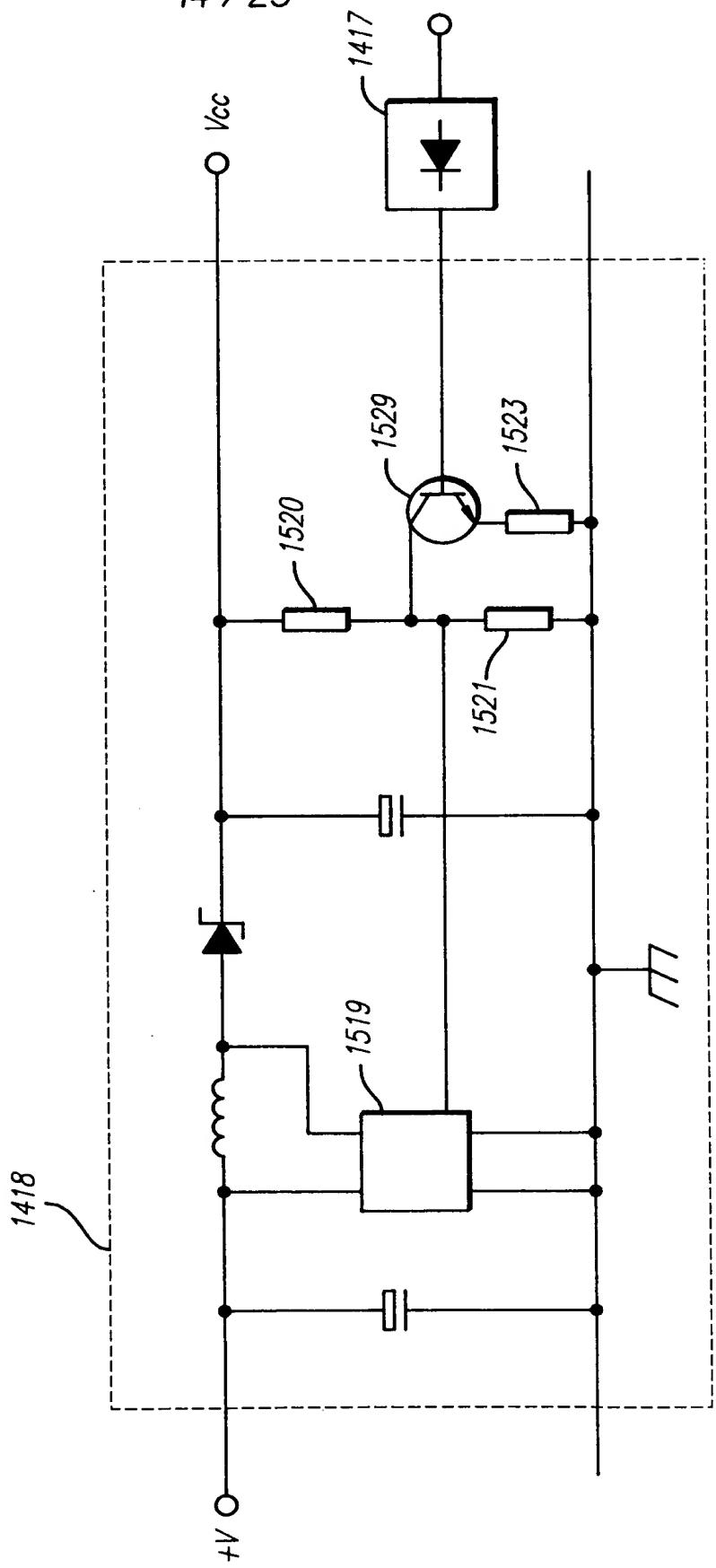
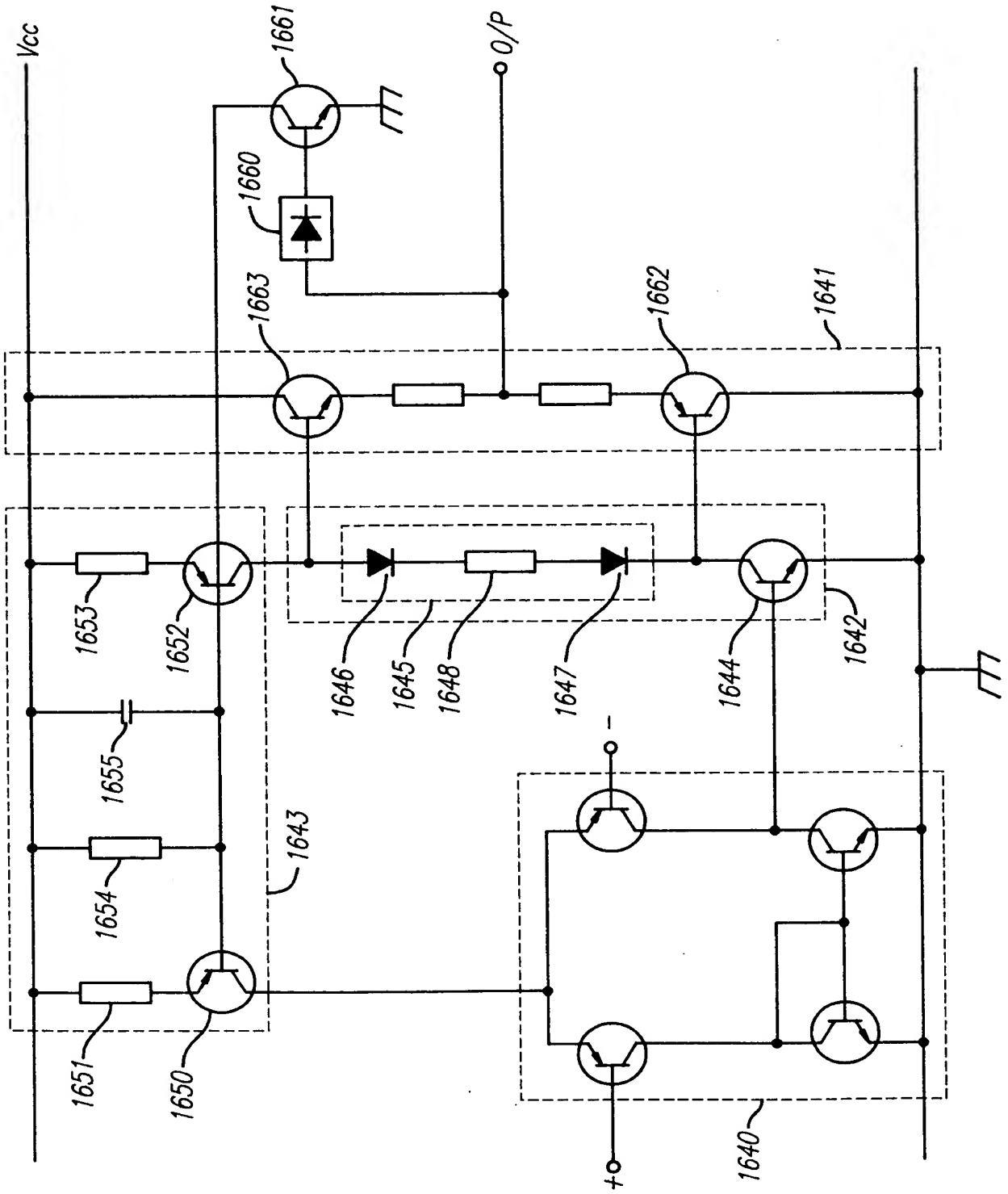


FIG. 16


Vcc
O/P
1661
1660
1663
1662
1641
1653
1652
1646
1645
1648
1647
1644
1642
1655
1643
1654
1651
1650
1640
-
+

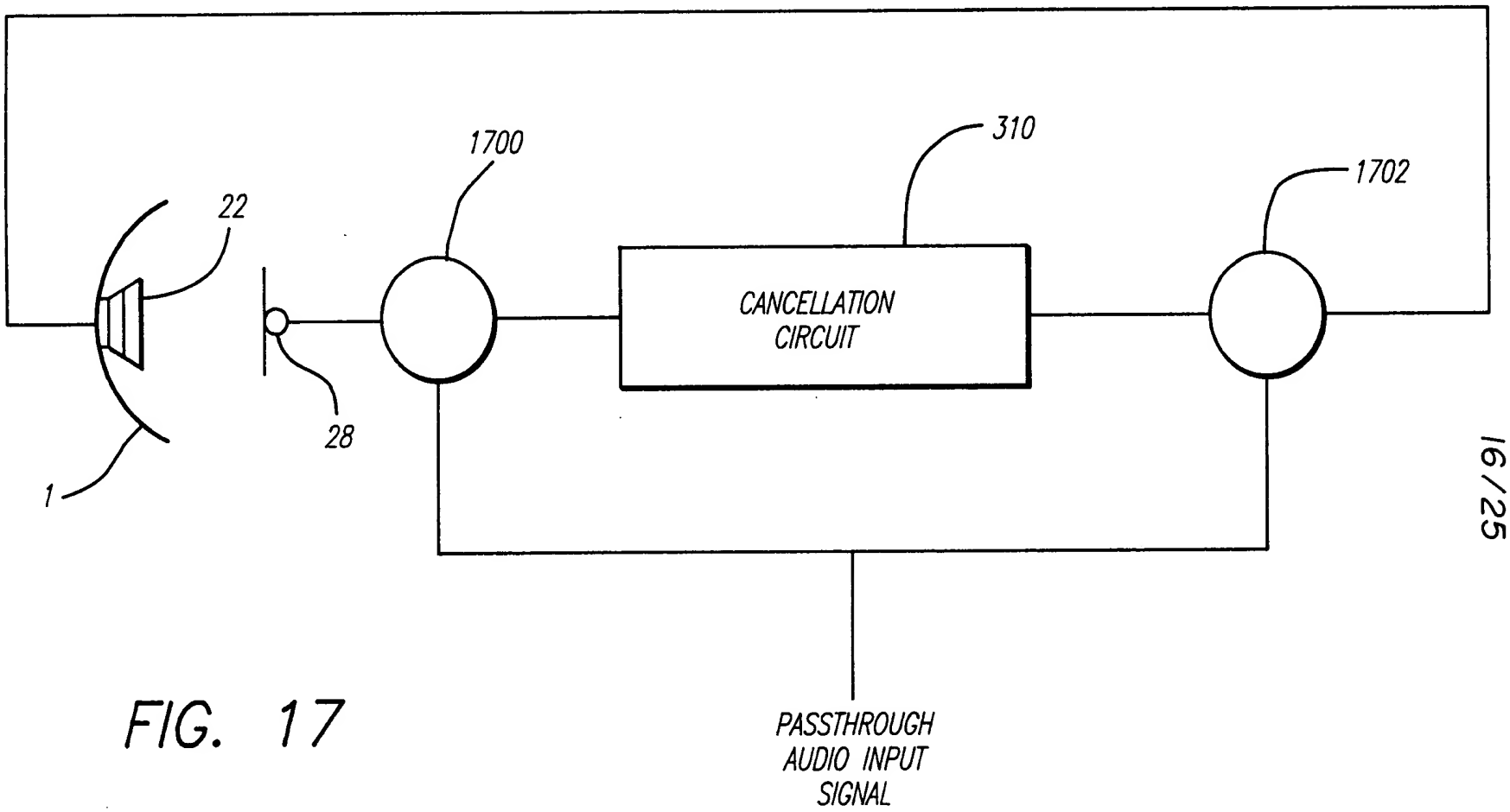

1700
310
1702
22
CANCELLATION CIRCUIT
28
1
PASSTHROUGH AUDIO INPUT SIGNAL

FIG. 17

FIG. 18

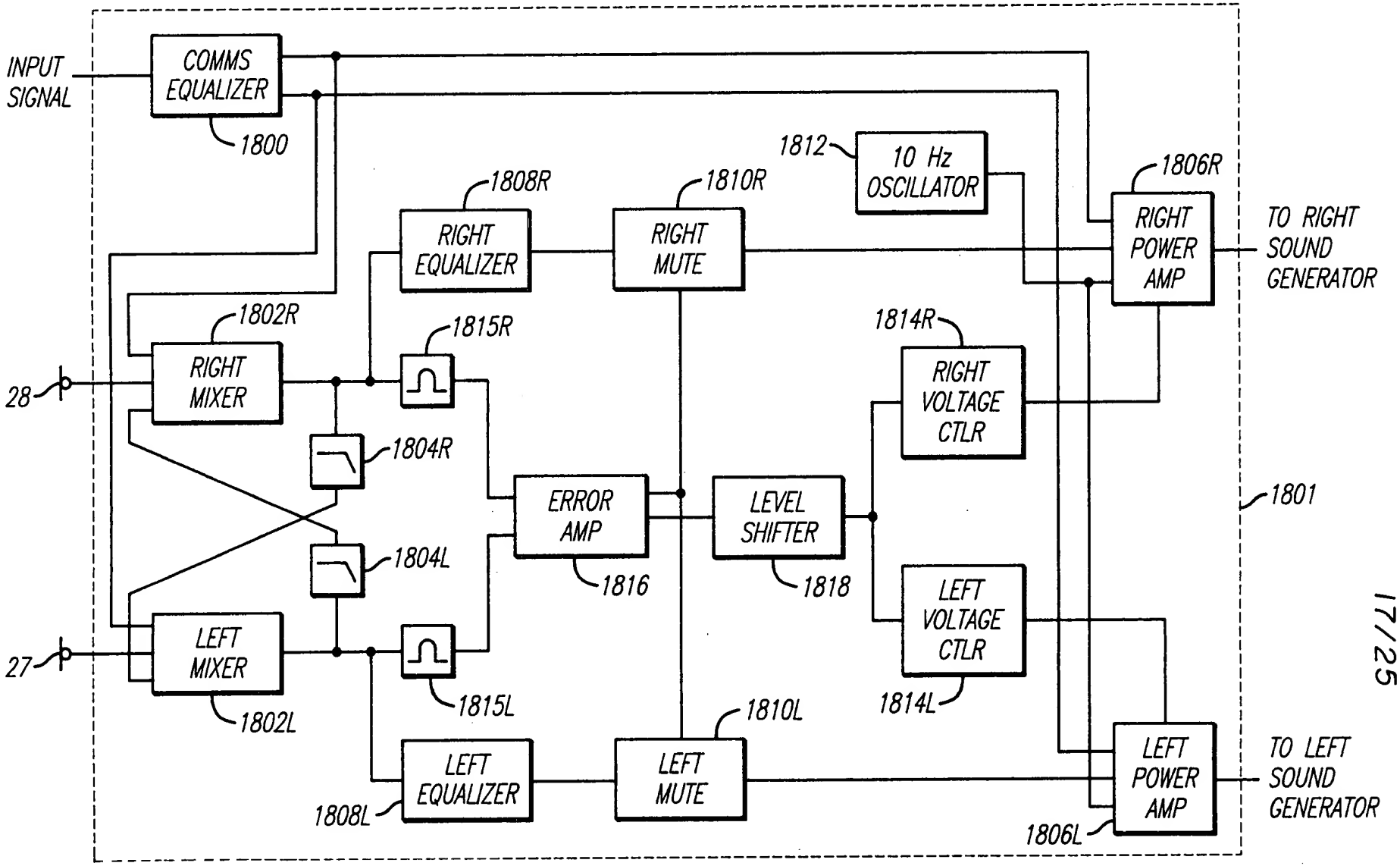
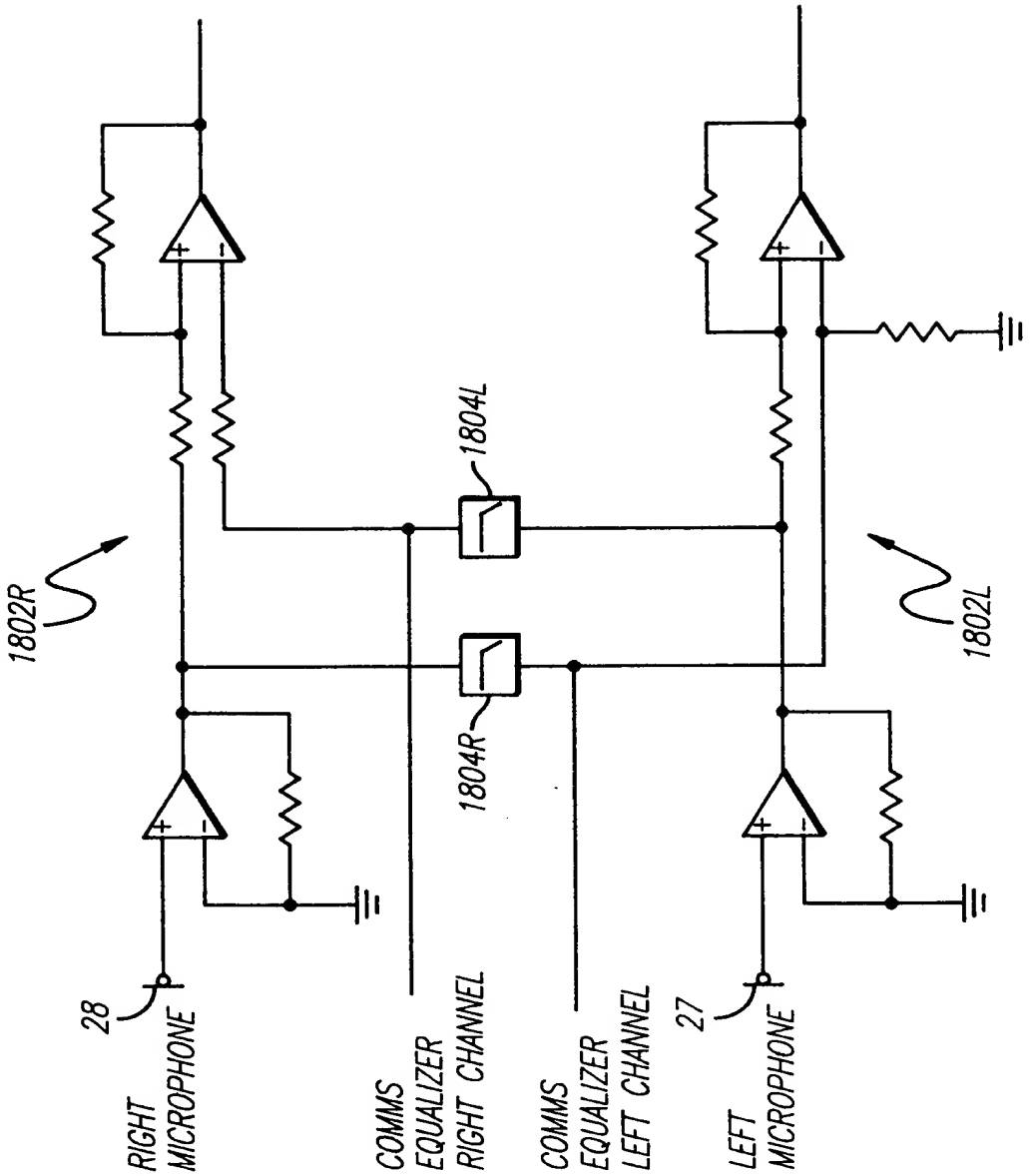

INPUT SIGNAL
COMMS EQUALIZER
1800
1812
10 Hz OSCILLATOR
1806R
RIGHT POWER AMP
TO RIGHT SOUND GENERATOR
1808R
RIGHT EQUALIZER
1810R
RIGHT MUTE
1802R
RIGHT MIXER
1815R
28
1804R
1814R
RIGHT VOLTAGE CTLR
ERROR AMP
1816
LEVEL SHIFTER
1818
1801
1804L
LEFT VOLTAGE CTLR
1814L
27
LEFT MIXER
1802L
1815L
1810L
LEFT EQUALIZER
1808L
LEFT MUTE
LEFT POWER AMP
1806L
TO LEFT SOUND GENERATOR

FIG. 19


1802R
1804L
1804R
1802L
28
RIGHT MICROPHONE
COMMS EQUALIZER RIGHT CHANNEL
COMMS EQUALIZER LEFT CHANNEL
27
LEFT MICROPHONE

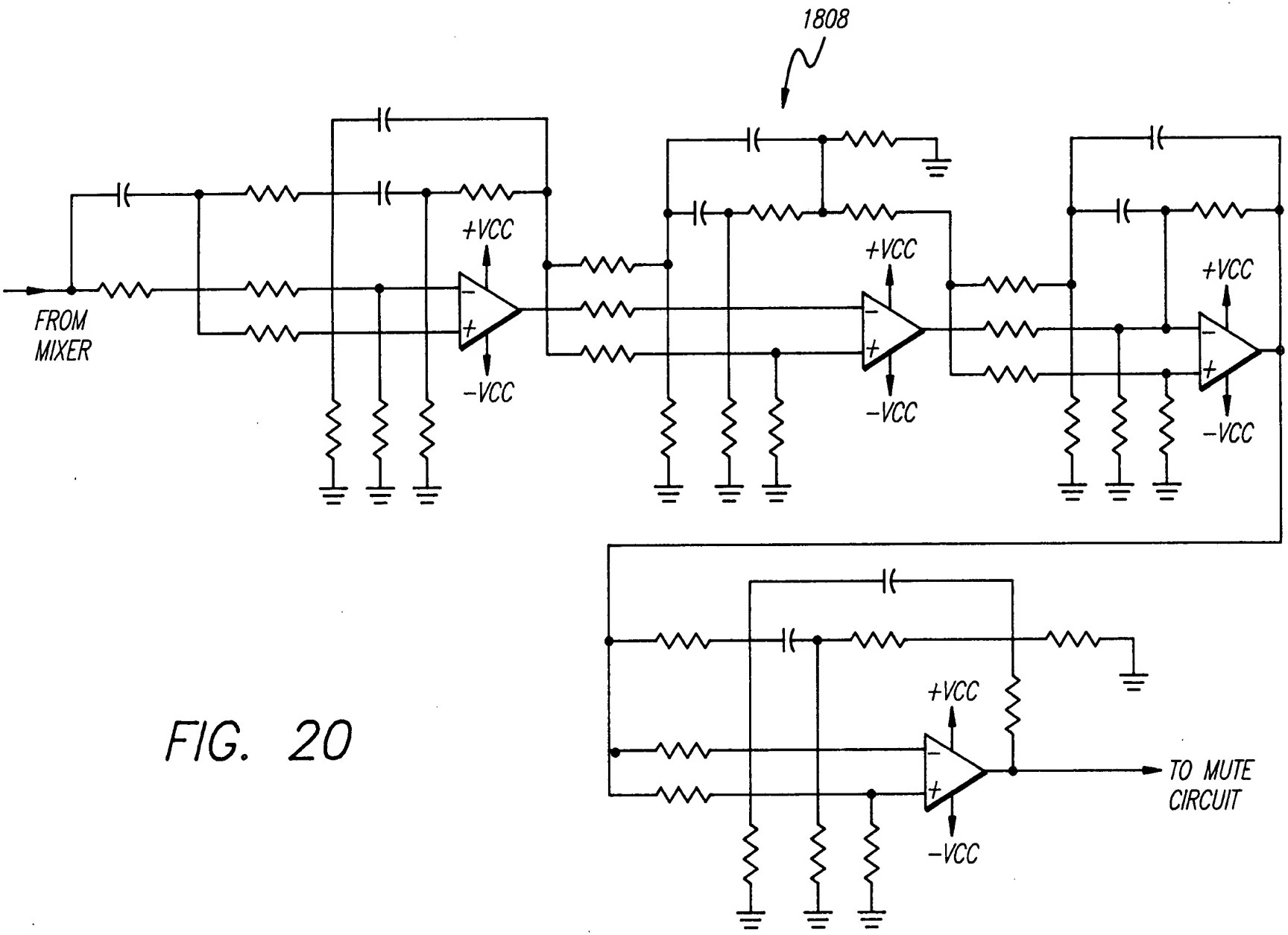

1808
FROM MIXER
+VCC
-VCC
+VCC
-VCC
+VCC
-VCC
+VCC
-VCC
TO MUTE CIRCUIT

FIG. 20

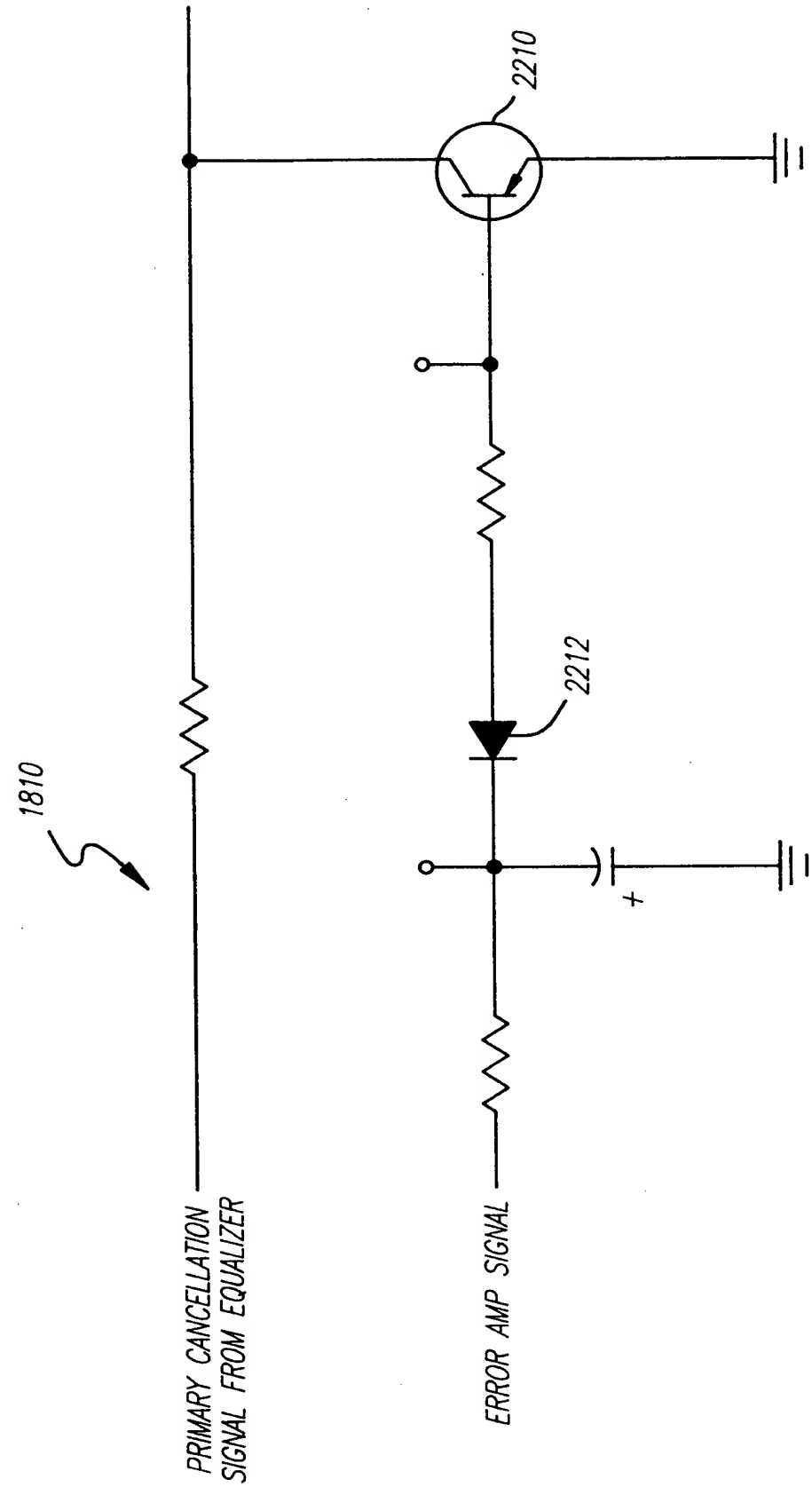

1810
PRIMARY CANCELLATION SIGNAL FROM EQUALIZER
2210
2212
ERROR AMP SIGNAL
+

FIG. 21

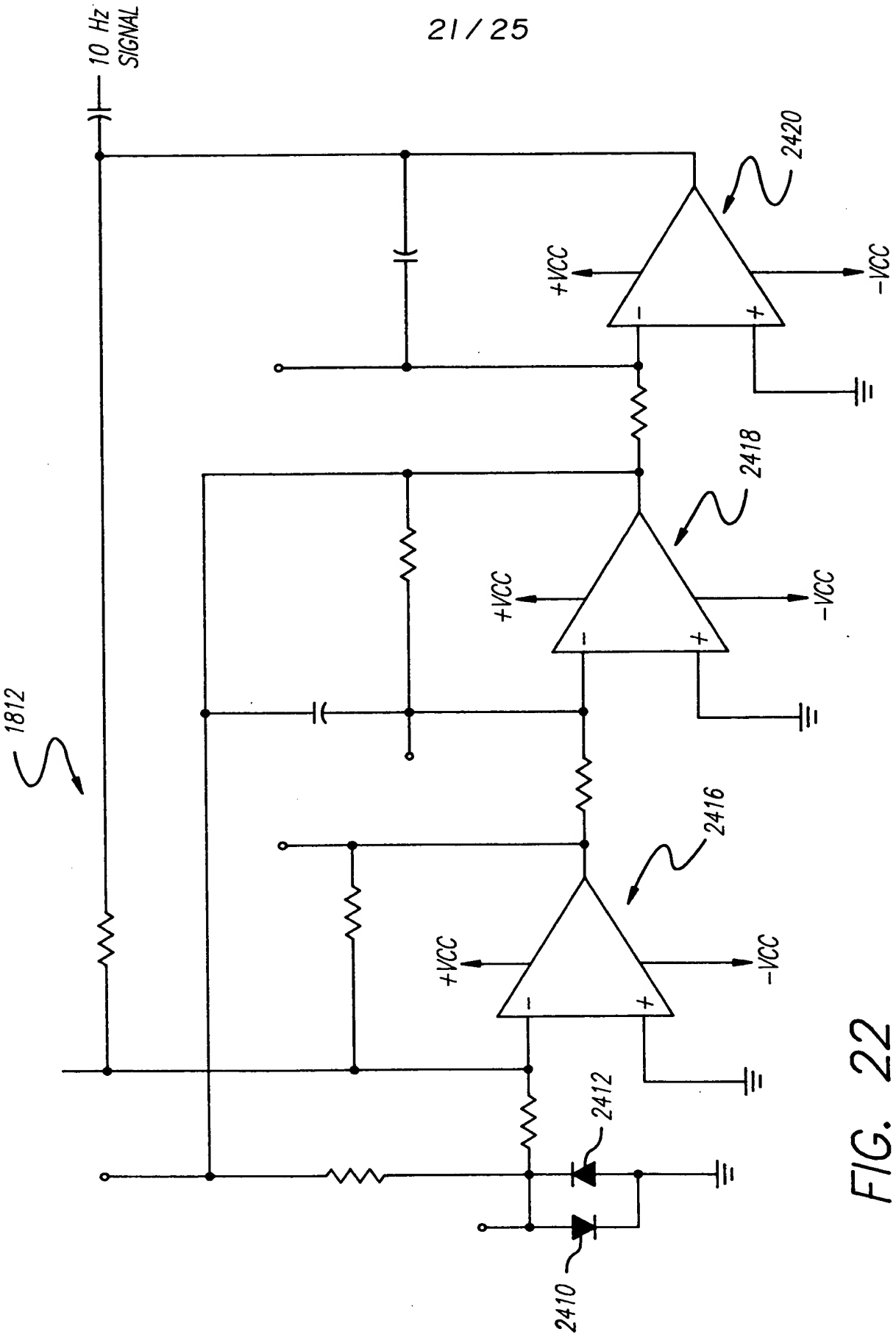


FIG. 22

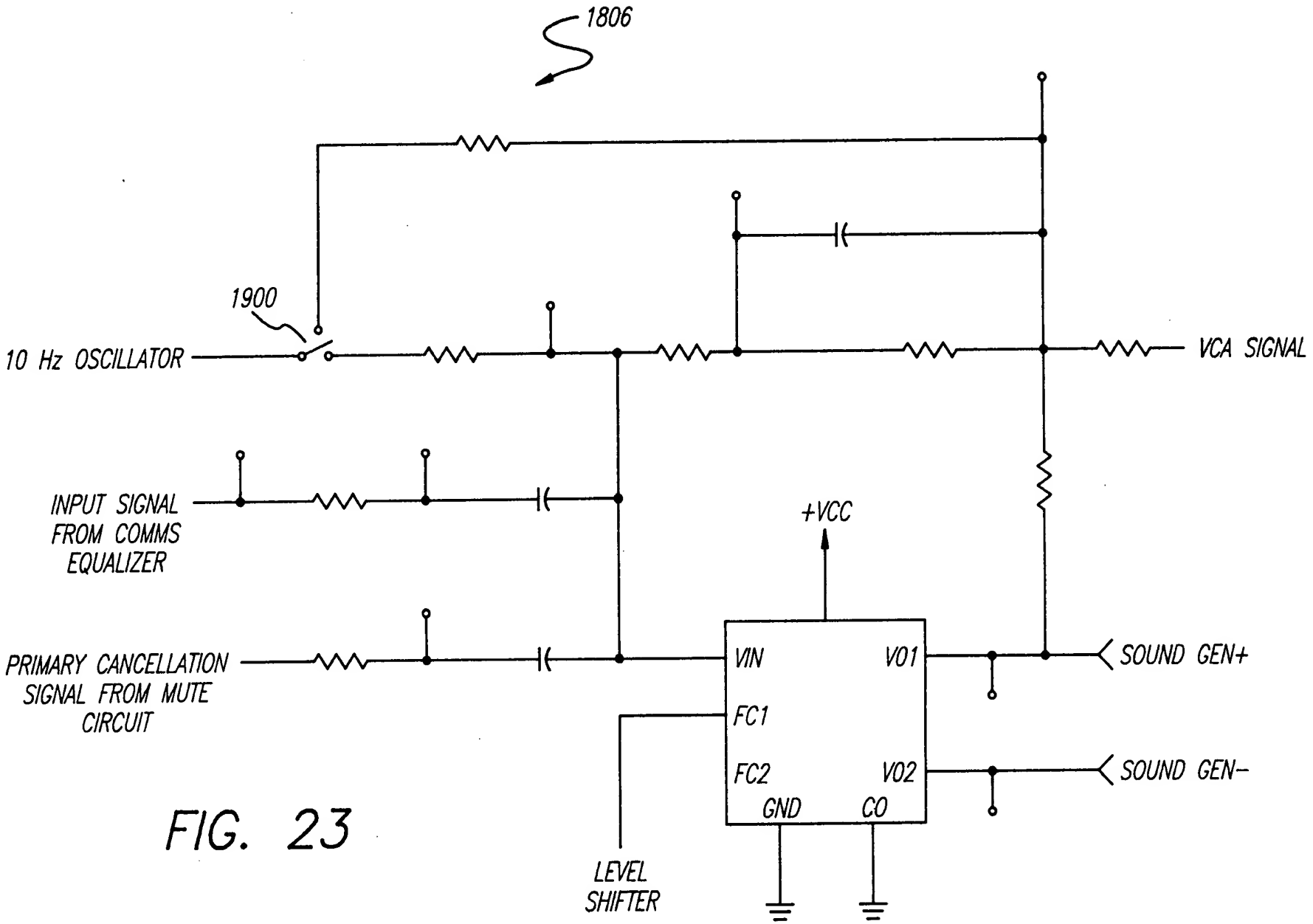

1806
1900
10 Hz OSCILLATOR
VCA SIGNAL
INPUT SIGNAL FROM COMMS EQUALIZER
+VCC
PRIMARY CANCELLATION SIGNAL FROM MUTE CIRCUIT
VIN
VO1
SOUND GEN+
FC1
FC2
VO2
SOUND GEN-
GND
CO
LEVEL SHIFTER

FIG. 23

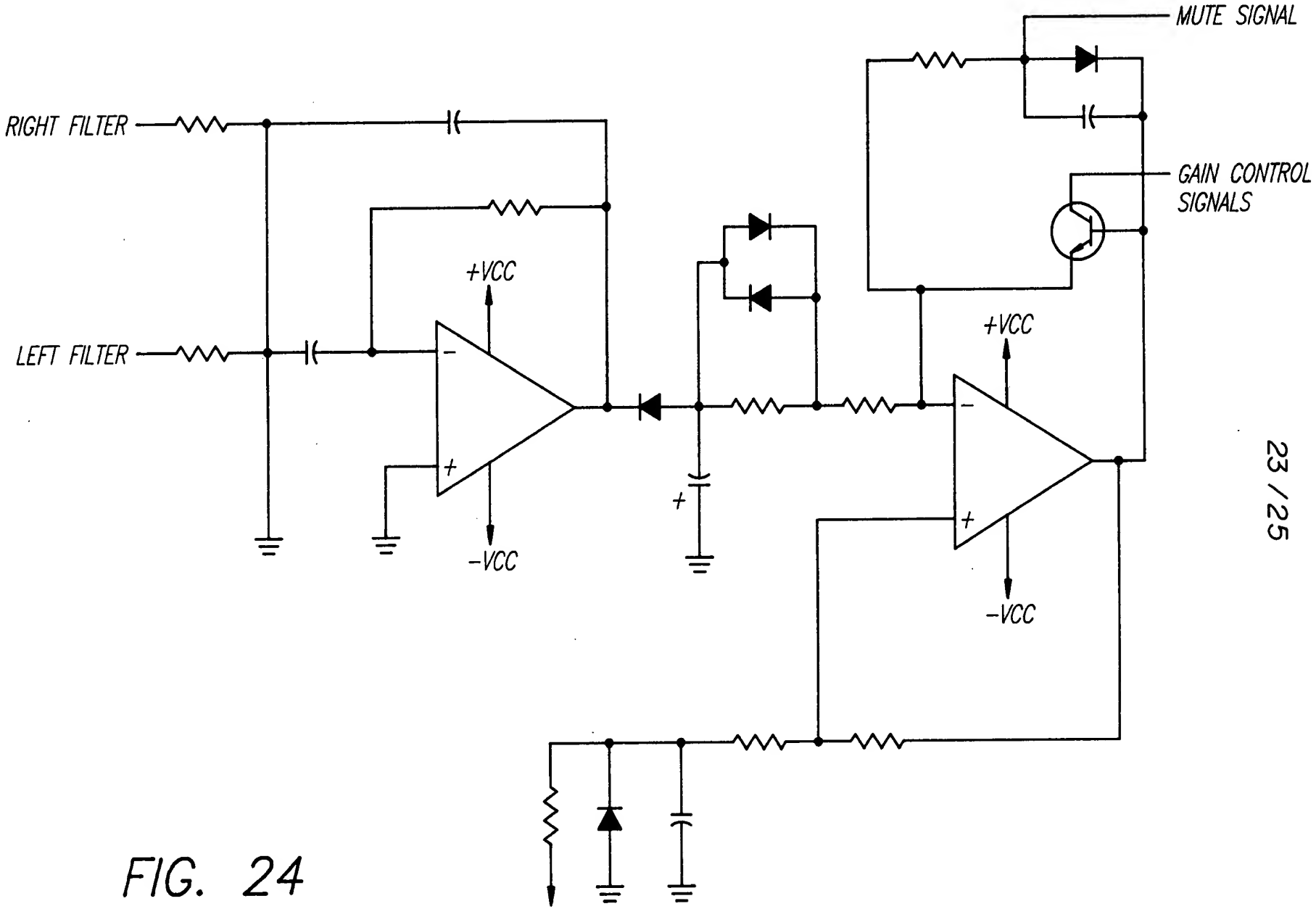

MUTE SIGNAL
RIGHT FILTER
GAIN CONTROL SIGNALS
+VCC
LEFT FILTER
+VCC
-VCC
-VCC

FIG. 24

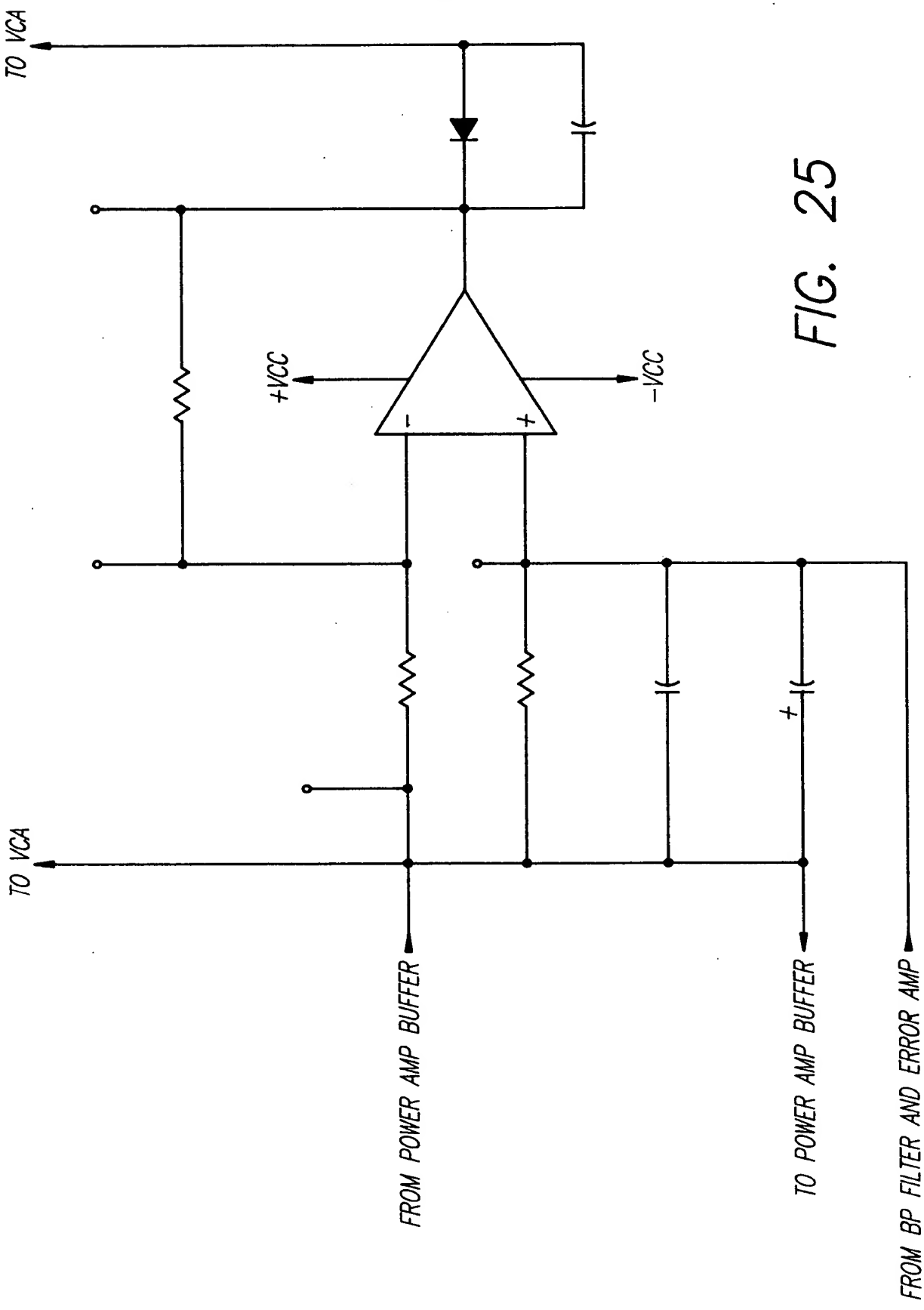

TO VCA
+VCC
-VCC
TO VCA
FROM POWER AMP BUFFER
TO POWER AMP BUFFER
FROM BP FILTER AND ERROR AMP

FIG. 25

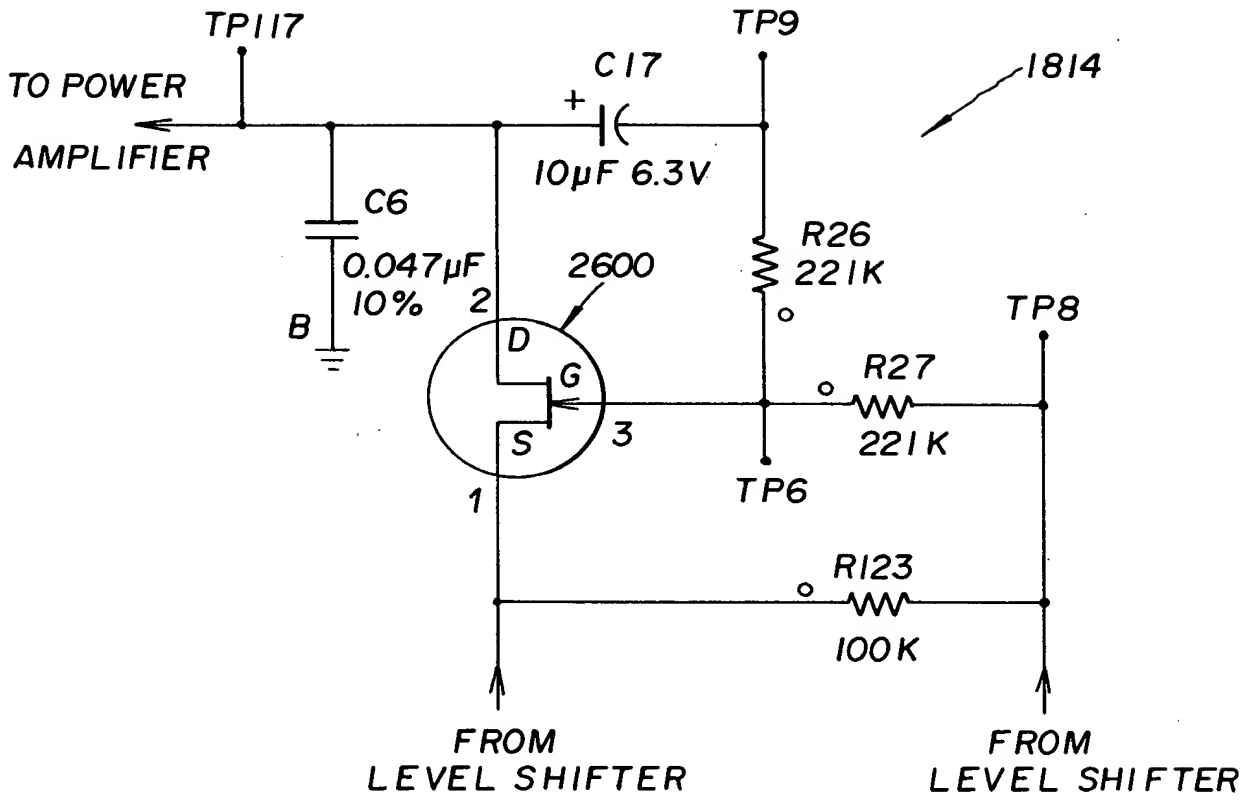

TP117
TO POWER
AMPLIFIER
C17
+
10μF 6.3V
TP9
1814
C6
0.047μF
10%
B
2600
2
D
G
S
3
1
R26
221K
TP8
R27
221K
TP6
R123
100K
FROM
LEVEL SHIFTER
FROM
LEVEL SHIFTER

FIG. 26